M-425

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MZ-425-14

SPECIFICATIONS

Tape
(MICROCASSETTE)™ (normal position type)
Recording system
2-track 1-channel monaural
Speaker
Approx. 3.6 cm (1 7/16 in.) dia.
Tape speed
2.4 cm/s (15/16 ips), 1.2 cm/s (15/32 ips)
Frequency range
250 – 4,000 Hz
Output
Earphone jack (minijack) for 8 – 300 ohms earphone
Power output
160 mW (at 10% harmonic distortion)
Battery life (recording)
SONY SUM-3 (NS) 5.5H
SONY ALKALINE AM3 (N) 14H
Power requirements
- Two R6 (size AA) batteries: 3 V DC
- Sony AC-E30M AC power adaptor (not supplied):
  220 V AC, 50 Hz (European model)
  120/220 V AC, 50/60 Hz (model for other countries)
- Sony DCC-E130L car battery cord (not supplied): 12 V car battery

Dimensions (w/h/d)
Approx. 66.7 x 120.8 x 25 mm incl. projecting parts and controls
Mass
Approx. 180 g incl. batteries
Supplied accessories (AEP, UK)
Microcassette tape MC-30 (1)

Design and specifications are subject to change without notice.

MICROCASSETTE™-CORDER

SONY®

SERVICING NOTE

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 ℃ during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

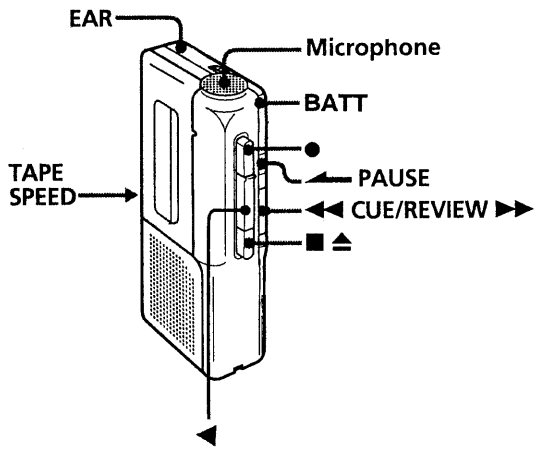
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
GENERAL

This section is extracted from instruction manual.

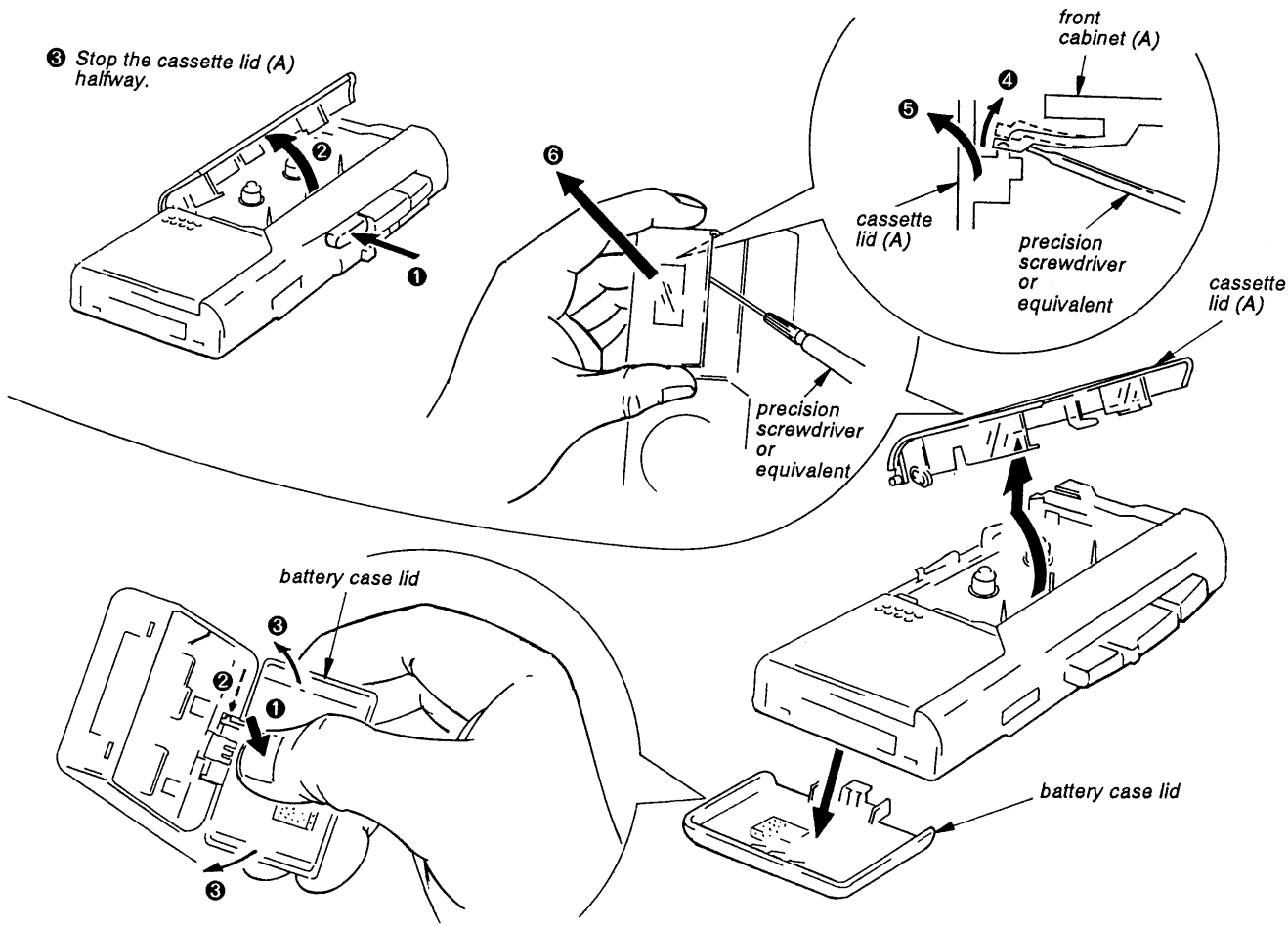
- **Parts Identification**



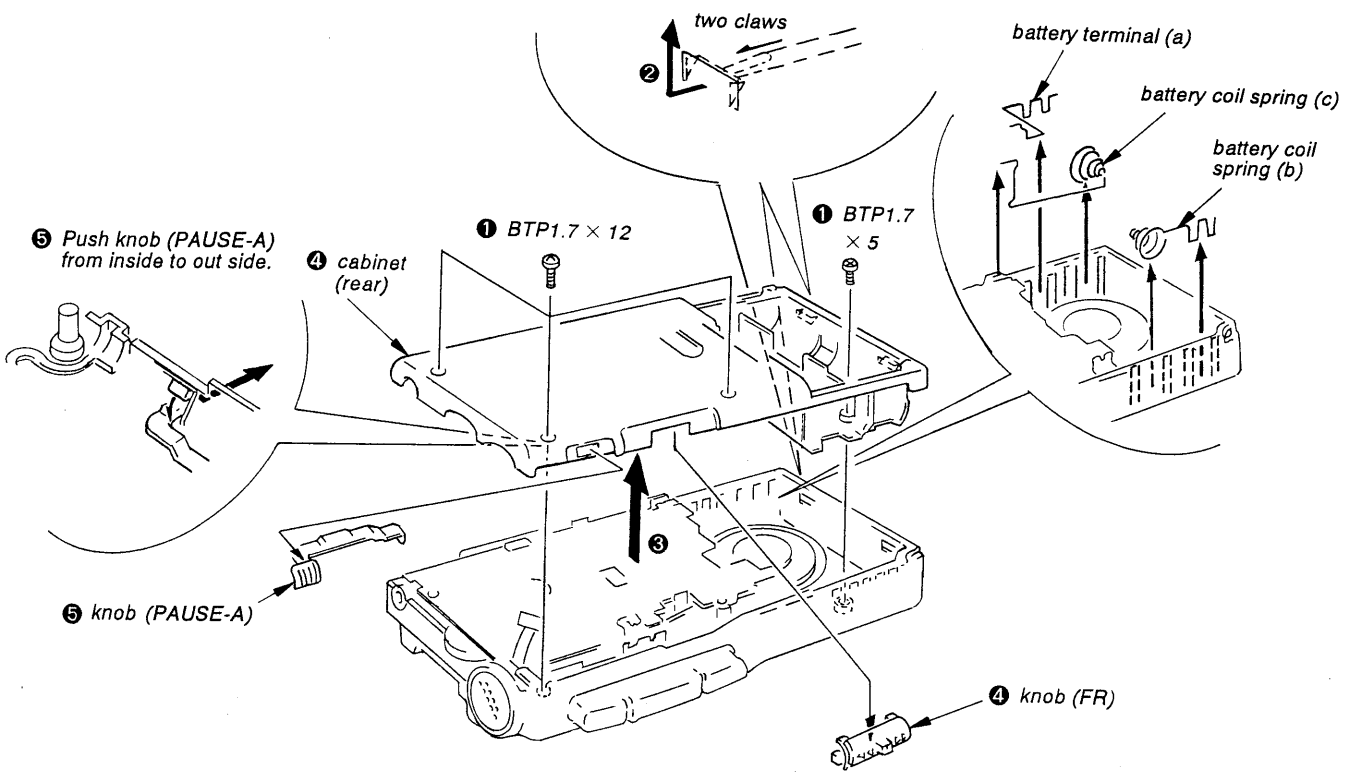
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

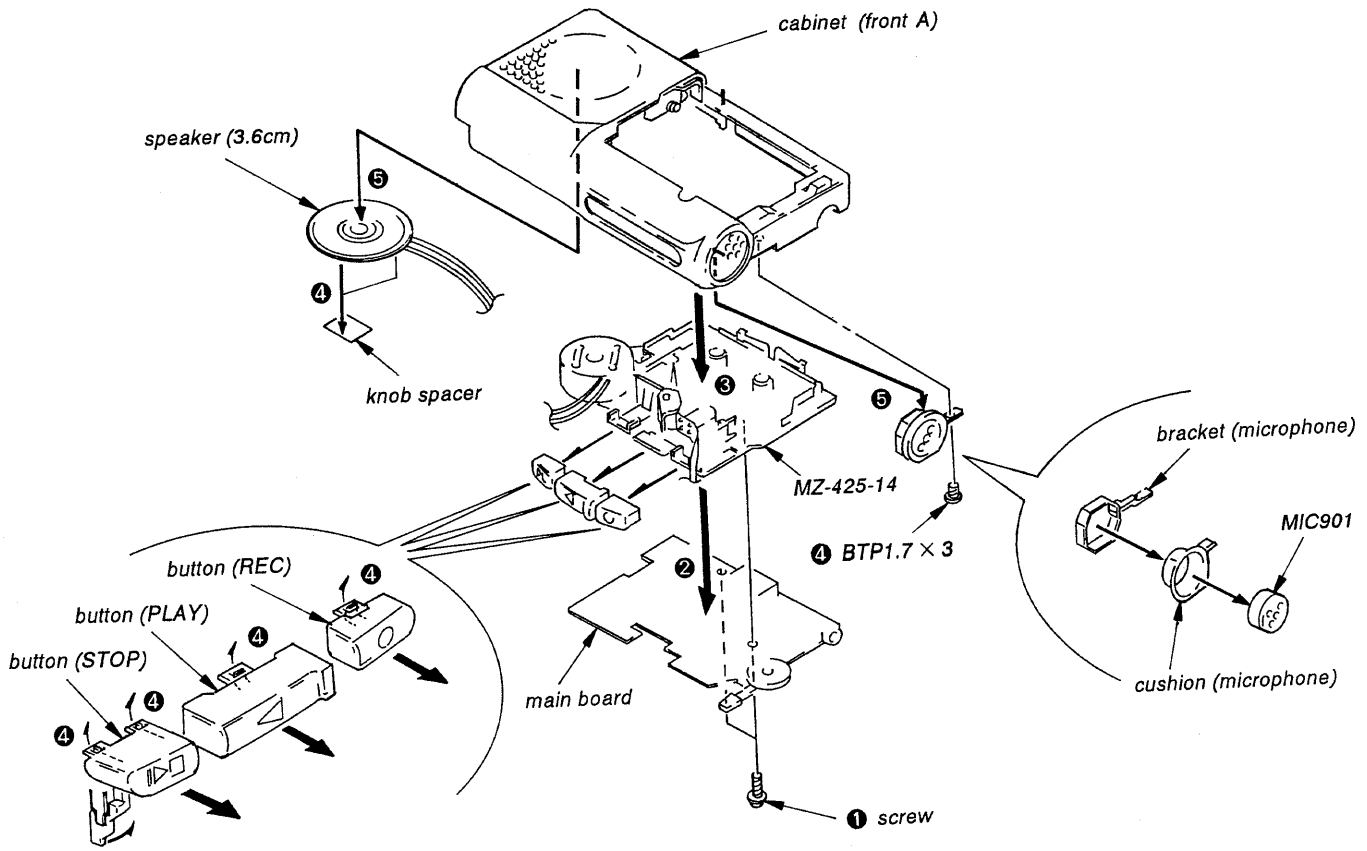
CASSETTE AND BATTERY LIDS



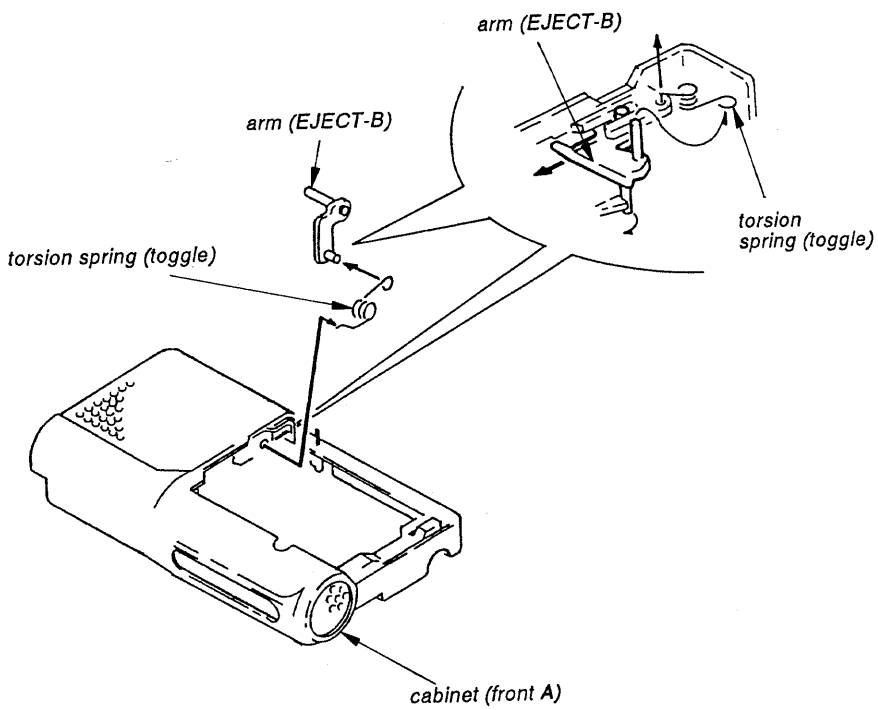
CABINET



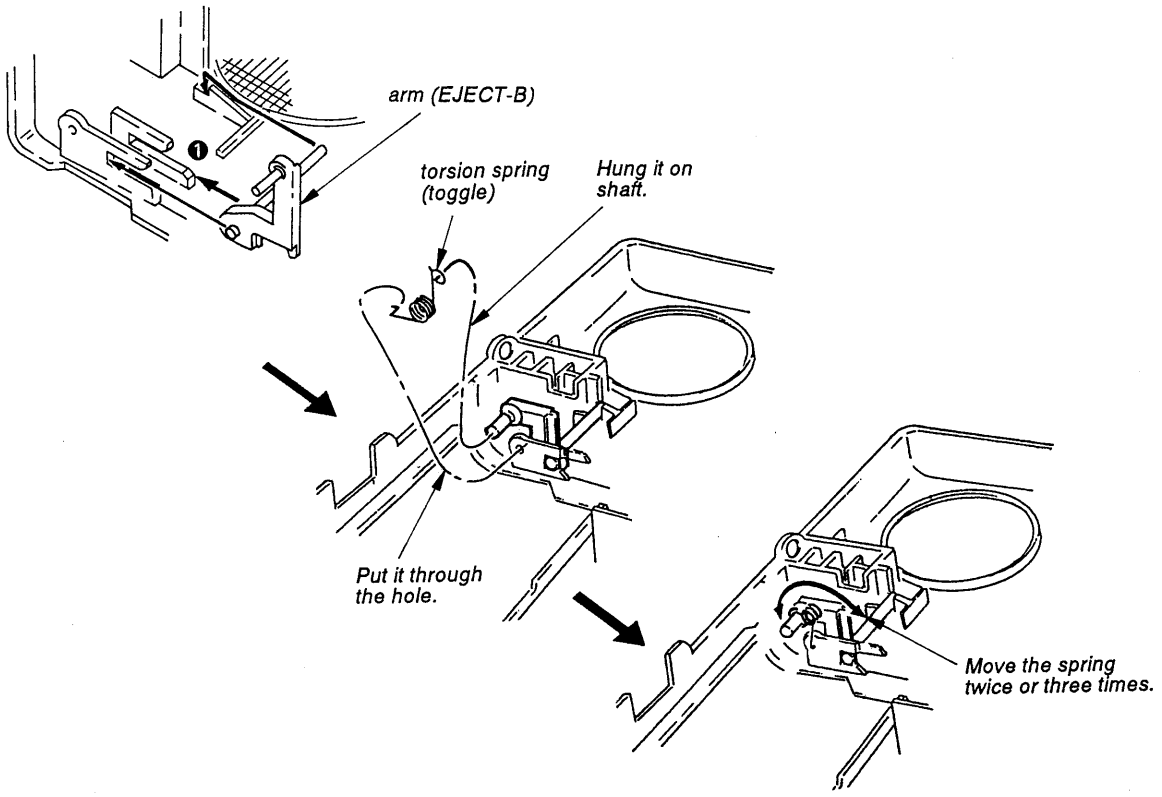
MECHANISM DECK



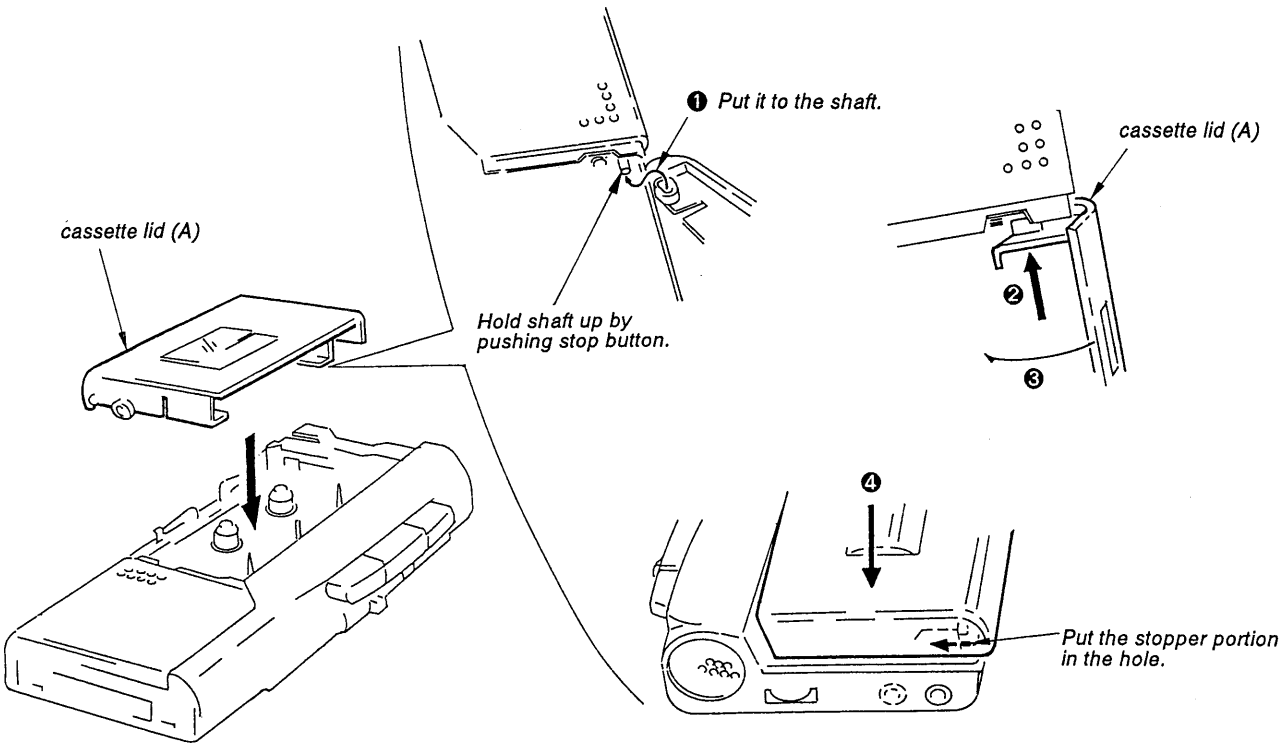
KNOB



ARM (EJECT) FITTING



CASSETTE LID (A) FITTING



SECTION 3
ADJUSTMENTS

2-1. MECHANICAL ADJUSTMENTS AND MEASUREMENT

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
   record/playback/erase head pinch roller
   rubber belts capstan
2. Demagnetize the record/playback head with a head demagentizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. The adjustments should be performed with the rated power supply voltage unless otherwise noted.
   Power supply voltage : 3 Vdc
   TAPE SPEED switch : 2.4 cm

Torque Measurement

Torqu	Meter Reading	Torqu Meter
Forward	5~13g • cm (0.07 – 0.180oz • inch)	CQ-103M
Fast Forward	5~13g • cm (0.07 – 0.180oz • inch)	CQ-201M
Rewind	more than 15 g • cm (more than 0.21oz • inch)	CQ-201M

Tape Tension Measurement

Meter	Meter Reading
CQ-403M	more than 30 g (more than 0.42 oz)

2-2. ELECTRICAL ADJUSTMENTS

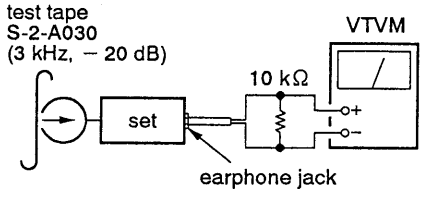
Test Tape

Type	Signal	Used for	Tape Speed (cm/s)
WS-12	3 kHz, – 10 dB	Tape Speed Adjustment	1.2
WS-24			2.4
S-2-A030	3 kHz, – 20 dB	Head Azimuth Adjustment	2.4

Record/Playback Head Azimuth Adjustment

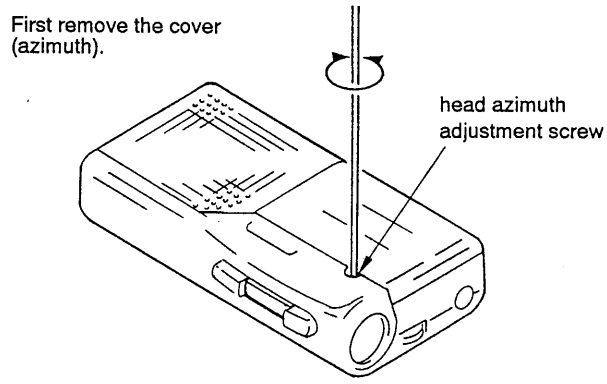
setting:
VOLUME control : mechanical mid
TAPE SPEED switch : 2.4 cm/s

Procedure:
1. Mode : playback



2. Turn the adjustment screw to obtain the maximum reading on VTVM.
   Note: Several peaks may appear, but the maximum.

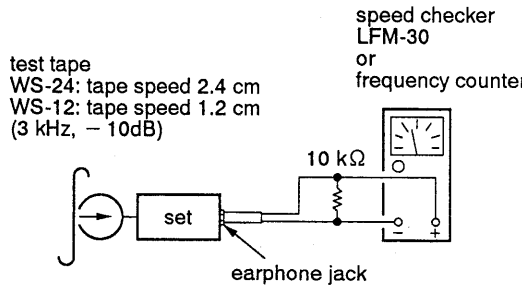
Adjustment Location:



Tape Speed adjustment

Setting:
VOLUME control : mechanical mid

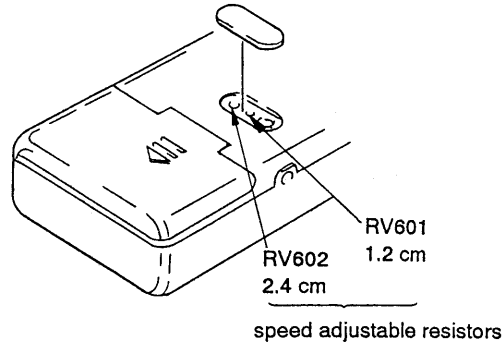
Procedure:
- Reform 2.4 cm /s speed adjustment before 1.2 cm/s speed adjustment
  mode : playback



Tape Speed	Speed checker	Frequency counter
2.4 cm/s	± 3%	3,000 ± 90 Hz
1.2 cm/s	± 3%	3,000 ± 90 Hz

Frequency difference between the beginning and the end of the tape should be within 0.5%.
2.4cm/s (15 Hz)
1.2 cm/s (15 Hz)

Adjustment Location:



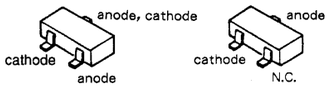
SECTION 4
DIAGRAMS

- **Semiconductor Location**

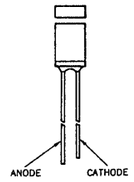
Ref. No.	Location
D101	F-12
D102	F-13
D401	K-5
IC101	H-11
IC601	J-18
Q101	D-10
Q102	E-10
Q103	F-10

- **Semiconductor Lead Layouts**

DA204U



GL-8PR42



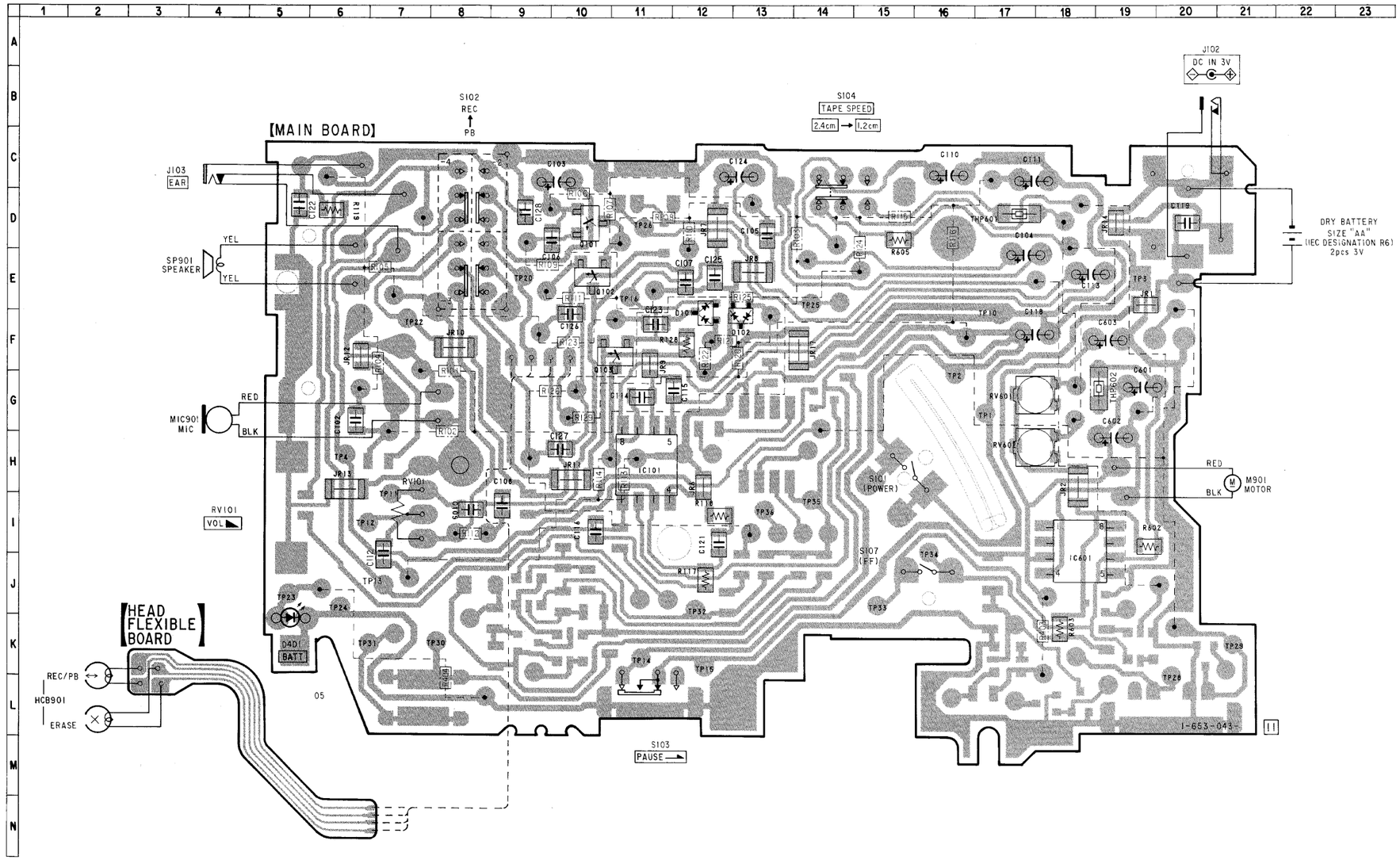
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- : printed resistor.
- B + : B + Line.
- : panel designation.
- : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages are dc with respect to ground under no-signal conditions.
  no mark : PLAY
  ( ) : REC
- Voltages are taken with a VOM (10 MΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB
  : REC

Note on Printed Wiring Board:

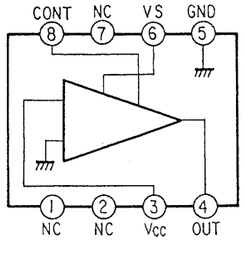
- : parts extracted from the component side.
- : Through hole.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : printed resistor of the rear side.

4-1. PRINTED WIRING BOARD

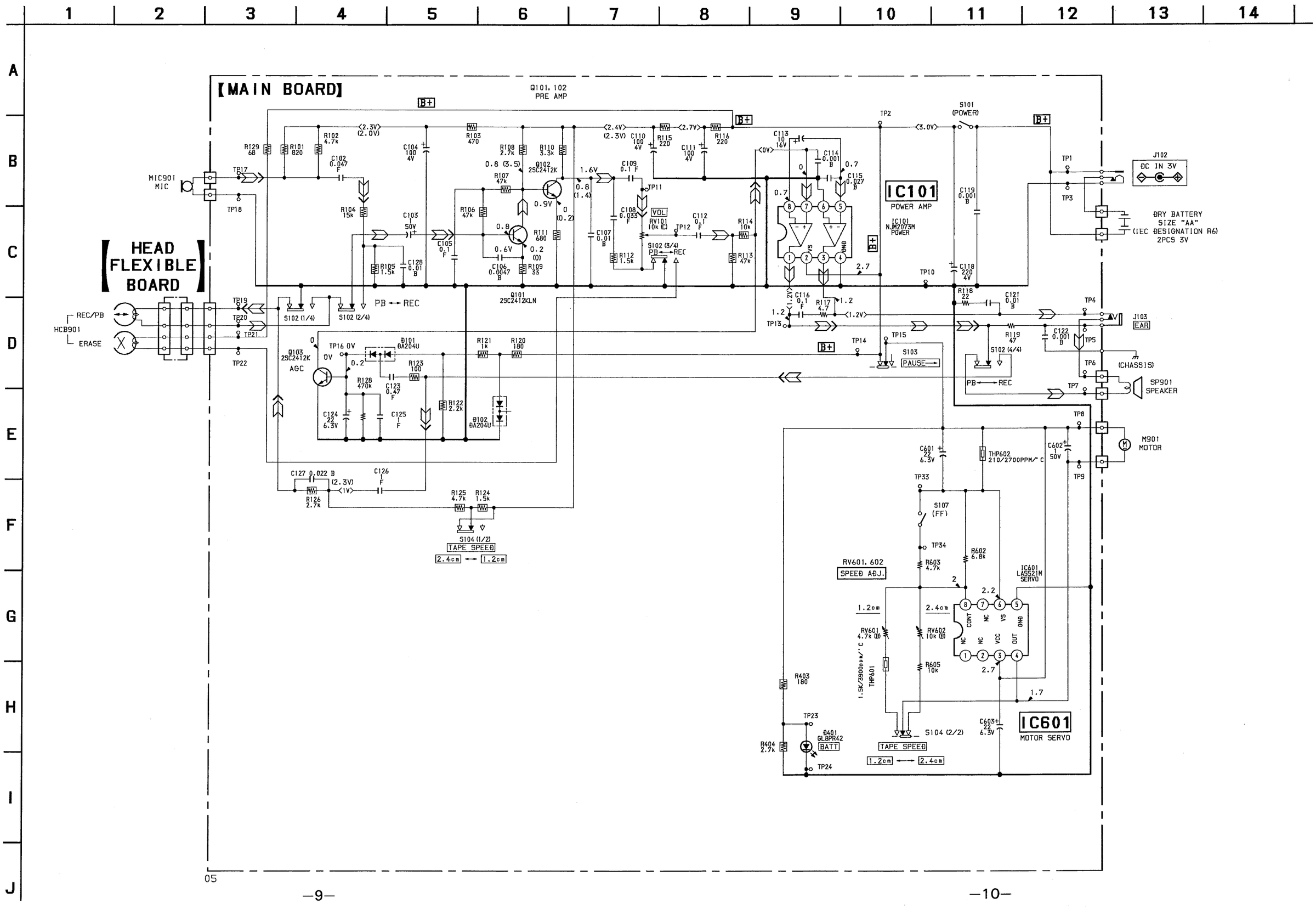


- **IC Block Diagram**

LA5521M



4-2. SCHEMATIC DIAGRAM

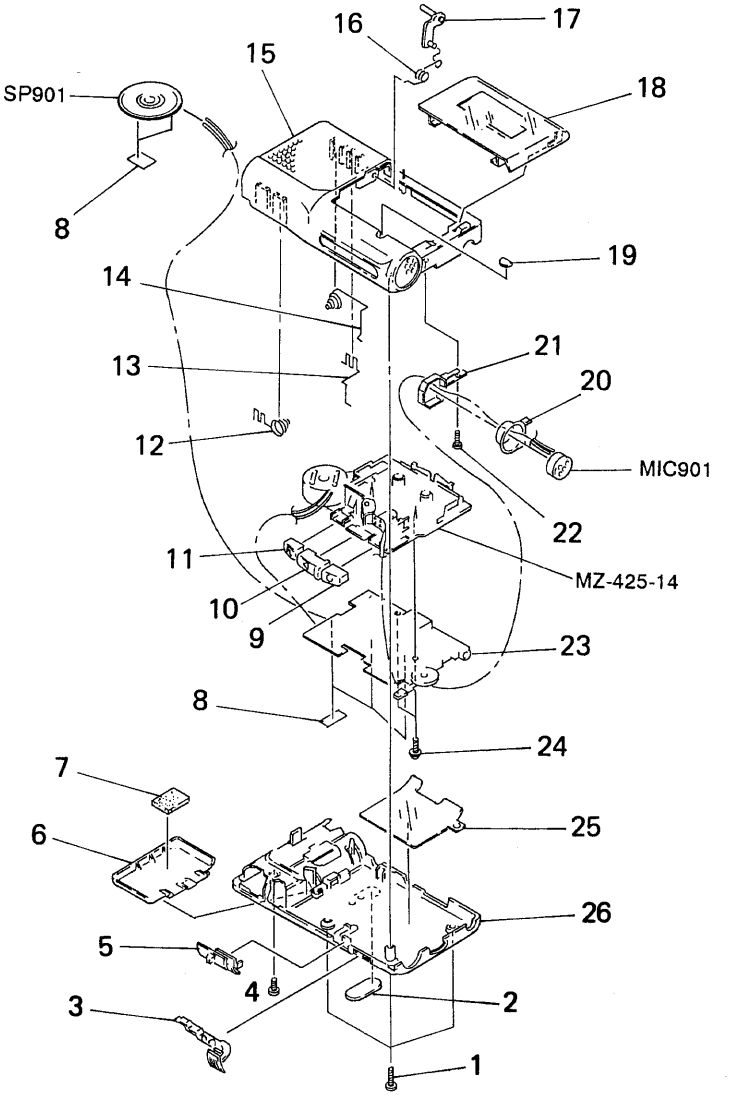


SECTION 5
EXPLODED VIEWS

NOTE:

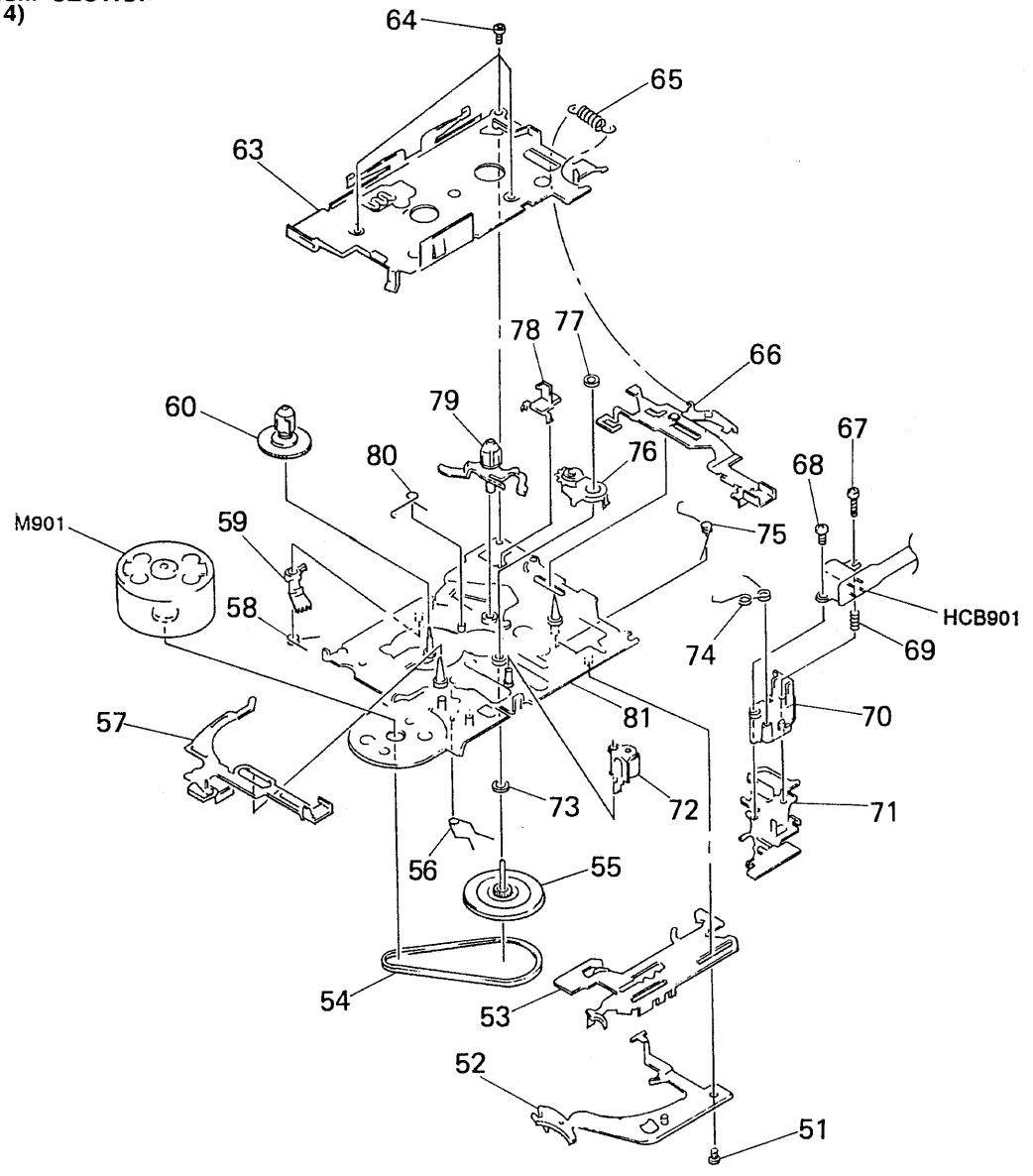
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

(1) GENERAL SECTION



Ref. No.	Part No.	Description	Remark
1	3-318-203-51	SCREW (B1.7X12), TAPPING	
2	3-358-363-11	PLATE, BLIND	
3	3-914-938-01	KNOB (PAUSE-A)	
4	3-318-203-72	SCREW (B1.7X5), TAPPING	
5	3-914-939-01	KNOB (FR)	
6	3-914-950-01	LID, BATTERY CASE	
* 7	3-914-930-01	CUSHION (BATTERY CASE LID)	
8	3-831-441-XX	SPACER, KNOB	
9	3-914-948-01	BUTTON (REC)	
10	3-914-947-01	BUTTON (PLAY)	
11	3-914-946-01	BUTTON (STOP)	
12	3-914-934-01	SPRING (B), BATTERY COIL	
13	3-914-933-01	TERMINAL (A), BATTERY	
14	3-914-932-01	SPRING (C), BATTERY COIL	
15	X-3368-590-1	CABINET (FRONT) (A4) ASSY	
16	3-914-931-01	SPRING (TOGGLE), TORSION	
17	3-914-936-01	ARM (EJECT-B)	
18	3-914-953-01	LID (A), CASSETTE	
19	3-914-952-01	COVER (AZIMUTH)	
* 20	3-914-937-01	CUSHION (MICROPHONE)	
* 21	3-914-949-01	BRACKET (MICROPHONE)	
22	3-318-382-31	SCREW (1.7X3), TAPPING	
* 23	A-3016-593-A	MAIN BOARD, COMPLETE	
24	3-342-156-51	SCREW	
25	3-914-929-01	PAPER, SHIELD	
* 26	3-914-958-01	CABINET (REAR)	
MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDENSER	
SP901	1-544-657-12	SPEAKER (3.6CM)	

(2) MECHANISM SECTION (MZ-425-14)



Ref. No.	Part No.	Description	Remark
51	3-704-243-11	SCREW (P1.7X2.0)	
* 52	3-914-920-01	PLATE (FR), LOCK	
* 53	3-914-919-01	SLIDER (FR)	
54	3-377-420-11	BELT	
55	X-3368-702-1	FLYWHEEL (1.3) ASSY	
56	3-914-903-01	SPRING (FR), TORSION	
* 57	X-3368-486-1	LEVER (STOP) ASSY	
58	3-914-906-01	SPRING (S.OFF), TORSION	
59	3-914-915-01	ARM (S.OFF)	
60	X-3368-582-1	REEL ASSY, T	
* 63	3-914-923-01	COVER, MD	
64	3-366-892-11	SCREW (M1.4X1.4)	
65	3-914-908-01	SPRING (REC LOCK), TENSION	
* 66	X-3368-583-1	LEVER (REC) ASSY	
67	3-703-816-82	SCREW (M1.4X6), SPECIAL HEAD	
68	3-704 245-42	SCREW (P1.4X3.0)	

Ref. No.	Part No.	Description	Remark
69	3-378-792-01	SPRING, COMPRESSION	
70	3-914-914-01	GUIDE, TAPE	
* 71	3-914-913-01	LEVER (PLATY)	
72	X-3368-585-1	PINCH LEVER ASSY	
73	3-350-945-11	WASHER	
74	3-914-902-01	SPRING (P), TORSION	
75	3-914-904-01	SPRING (PFR), TORSION	
76	X-3368-584-1	ARM (MIDWAY GEAR) ASSY	
77	3-331-007-21	WASHER	
78	3-914-916-01	ARM (CKAW DETECTION)	
79	X-3368-587-1	REEL ASSY, S	
80	3-914-907-01	SPRING (MIDWAY GEAR), TORSION	
* 81	X-3368-701-1	CHASSIS (COMP.) ASSY (C), MECH	
HCB901	1-500-135-11	HEAD, MAGNETIC (REC/PB/ERASE)	
M901	1-698-384-11	MOTOR, DC	

SECTION 6
ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA . . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. . uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-3016-593-A	MAIN BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C102	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C103	1-104-390-21	ELECT	1uF	20%	50V
C104	1-104-401-21	ELECT	100uF	20%	4V
C105	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C106	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-034-00	CERAMIC CHIP	0.033uF		50V
C109	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C110	1-104-401-21	ELECT	100uF	20%	4V
C111	1-104-401-21	ELECT	100uF	20%	4V
C112	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C113	1-104-368-21	ELECT	10uF	20%	16V
C114	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C115	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C116	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C118	1-104-402-21	ELECT	220uF	20%	4V
C119	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C121	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C122	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C123	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C124	1-104-355-21	ELECT	22uF	20%	6.3V
C125	1-164-346-11	CERAMIC CHIP	1uF		16V
C126	1-164-346-11	CERAMIC CHIP	1uF		16V
C127	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C601	1-104-355-21	ELECT	22uF	20%	6.3V
C602	1-104-390-21	ELECT	1uF	20%	50V
C603	1-104-355-21	ELECT	22uF	20%	6.3V
		< DIODE >			
D101	8-719-941-23	DIODE	DA204U		
D102	8-719-941-23	DIODE	DA204U		
D401	8-719-026-62	DIODE	GL8PR42 (BATT)		

Ref. No.	Part No.	Description			Remark
		< IC >			
IC101	8-759-701-02	IC	NJM2073M		
IC601	8-759-804-43	IC	LA5521M		
		< JACK >			
J102	1-580-372-41	JACK, DC (POLARITY UNIFIED TYPE) (DC IN 3V)			
J103	1-766-156-11	JACK (EAR)			
		< JUMPER RESISTOR >			
JR1	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR2	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR3	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR6	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR7	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR8	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR9	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR10	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR11	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR12	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR13	1-216-296-00	METAL GLAZE	0	5%	1/8W
JR14	1-216-295-00	METAL GLAZE	0	5%	1/10W
JR17	1-216-296-00	METAL GLAZE	0	5%	1/8W
		< TRANSISTOR >			
Q101	8-729-016-80	TRANSISTOR	2SC2412KLN-T146-R		
Q102	8-729-920-74	TRANSISTOR	2SC2412K-QR		
Q103	8-729-920-74	TRANSISTOR	2SC2412K-QR		
		< RESISTOR >			
R101	1-249-416-11	CARBON	820	5%	1/4W F
R102	1-249-425-11	CARBON	4.7K	5%	1/4W F
R103	1-249-413-11	CARBON	470	5%	1/4W F
R104	1-216-077-00	METAL CHIP	15K	5%	1/10W
R105	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R106	1-249-437-11	CARBON	47K	5%	1/4W
R107	1-249-437-11	CARBON	47K	5%	1/4W
R108	1-249-422-11	CARBON	2.7K	5%	1/4W F
R109	1-249-399-11	CARBON	33	5%	1/4W F

SEE ADDITIONAL INFORMATION

MAIN

Ref. No.	Part No.	Description			Remark
R110	1-249-423-11	CARBON	3.3K	5%	1/4W F
R111	1-249-415-11	CARBON	680	5%	1/4W F
R112	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R113	1-249-437-11	CARBON	47K	5%	1/4W
R114	1-249-429-11	CARBON	10K	5%	1/4W
R115	1-216-033-00	METAL CHIP	220	5%	1/10W
R116	1-216-033-00	METAL CHIP	220	5%	1/10W
R117	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R118	1-216-009-00	METAL CHIP	22	5%	1/10W
R119	1-216-017-00	METAL CHIP	47	5%	1/10W
R120	1-249-408-11	CARBON	180	5%	1/4W F
R121	1-249-417-11	CARBON	1K	5%	1/4W F
R122	1-249-421-11	CARBON	2.2K	5%	1/4W F
R123	1-247-807-31	CARBON	100	5%	1/4W
R124	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R125	1-249-425-11	CARBON	4.7K	5%	1/4W F
R126	1-249-422-11	CARBON	2.7K	5%	1/4W F
R128	1-216-113-00	METAL CHIP	470K	5%	1/10W
R129	1-216-021-00	METAL CHIP	68	5%	1/10W
R403	1-249-408-11	CARBON	180	5%	1/4W F
R404	1-249-422-11	CARBON	2.7K	5%	1/4W F
R602	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R603	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R605	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV101	1-237-731-21	RES, VAR, CARBON 10K (VOL)
RV601	1-238-663-11	RES, ADJ, CARBON 4.7K
RV602	1-223-586-11	RES, ADJ, CARBON 10K

< SWITCH >

S101	1-572-688-11	SWITCH, PUSH (1 KEY) (POWER)
S102	1-692-999-11	SWITCH, SLIDE (REC/PB)
S103	1-571-275-31	SWITCH, SLIDE (PAUSE)
S104	1-571-478-11	SWITCH, SLIDE (TAPE SPPED)
S107	1-572-688-11	SWITCH, PUSH (1 KEY) (FF)

< POSITIVE THERMISTOR >

THP601	1-808-956-11	THERMISTOR, POSITIVE
THP602	1-809-757-11	THERMISTOR, POSITIVE

****

MISCELLANEOUS

****

HCB901	1-500-135-11	HEAD, MAGNETIC (REC/PB/ERASE)
M901	1-698-384-11	MOTOR, DC
MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDENSER
SP901	1-544-657-12	SPEAKER (3.6CM)

Ref. No.	Part No.	Description	Remark

ACCESSORIES & PACKING MATERIALS

****

	3-758-981-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (AEP, UK, E)
	3-758-981-71	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP)
	3-758-981-81	MANUAL, INSTRUCTION (ENGLISH) (US, Canadian)
	3-758-981-91	MANUAL, INSTRUCTION (FRENCH) (Canadian)
*	3-916-680-01	INDIVIDUAL CARTON (AEP, UK)
*	3-916-682-01	INDIVIDUAL CARTON (E)
*	3-916-688-11	CUSHION

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M-425

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

SUPPLEMENT-1

File this supplement with the service manual.

Subject :
1. Addition of Instruction Manual for AEP Model
2. Addition of Mexican Model

(ENG-96006)

1. Addition of Instruction Manual for AEP Model

• ACCESSORIES & PACKING MATERIALS

Page	Ref. No.	Part No.	Description
14	–	3-810-462-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, DUTCH)

2. Addition of Mexican Model

Mexican model have been added.
There are the same as E model which is not described in this supplement-1. Refer to M-425 original service manual (9-959-543-11) for the other informations.

• ACCESSORIES & PACKING MATERIALS

		E model		Mexican model	
Page	Ref. No.	Part No.	Description	Part No.	Description
14	–	3-758-981-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)	3-810-462-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, DUTCH)
	*	3-916-682-01	INDIVIDUAL CARTON	————	————
	*	3-916-688-11	CUSHION	————	————
	*	————	————	3-916-760-01	CUSHION (TOP)
	*	————	————	3-916-761-01	CUSHION (BOTTOM)

• Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

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M-425

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

SUPPLEMENT-2

File this supplement with the service manual.

Subject: Change of MAIN board (EXCEPT US, Canadian Model)

- **New/former Discrimination**

	Former Type	New Type
Main Board Part No.	1-653-043-□□	1-664-894-□□

The New Type Main Board of information, refer to the M-437 service manual (9-923-127-11) previously issued.

9-959-543-82

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M-425

SONY

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model

SUPPLEMENT-3

File this supplement with the service manual.

Subject: Addition of East European Model

Addition of East European Model
East European model have been added.
There are the same as AEP model which is not described in this supplement-3.
Refer to M-425 original service manual (9-959-543-11) for the other informations.

• ACCESSORIES & PACKING MATERIALS

Page	AEP model				East European model			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
14		3-758-981-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE)			3-858-067-35	MANUAL, INSTRUCTION (ENGLISH, GERMAN, SPANISH, PORTUGUESE)	
		3-758-981-71	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN)			3-858-067-91	MANUAL, INSTRUCTION (RUSSIAN, HUNGARIAN, CZECH, POLISH)	

9-959-543-83

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